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CLINICAL SIGNS COMMON TO MOUTH, NOSE,
THROAT AND EAR.

The Cephalic Mucous Membrane.

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Emeritus Professor of Physiology, University of Pennsylvania.



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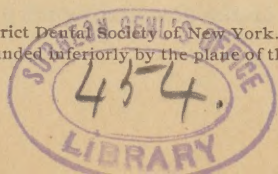
If the student examines the open mouth in the dead subject, he sees lying at the floor the tongue and the teeth of the lower jaw; above, the roof of the mouth and the upper jaw; at the sides, the cheeks; behind, the soft palate, the tonsils and the posterior wall of the pharynx. A glance takes in these outlines of an apparently sharply limited region. Now, let an attempt be made to remove the parts already defined. The specimen will include, necessarily, the face and the pharynx; and the boundaries of the mouth will be found to be anything but sharply limited. The same remark is true of the nose, the throat and the ear. It may be accepted as an axiom that structures which are associated anatomically will be found to be associated clinically also. Hence, the mouth by itself, the nose by itself, the pharynx by itself, the ear by itself, the nasal chambers by themselves, as well as all related avenues, whether they are thoroughfares or blind-alleys (and these embrace structures so disassociated as the lachrymal ducts, the maxillary, frontal and sphenoidal sinuses), are regions with imperfect boundaries, for each demands something of the others.

It is to the clinical signs yielded by the mucous surfaces contained within such a specimen and thus represented in the living subject as a natural, yet complicated, region, to which I would invite your attention. I will treat of it as a great system (the several parts of which are inter-dependent), which may receive conveniently the name of the *cephalic mucous membrane*.²

The Sense of Fatigue which Ensues upon the Act of Reading Aloud.—Let me here refer to an illustration of the artificial distinctions which are used to separate the subdivisions of the cephalic mucous membrane. In speech and in singing it is required to bring into play every portion of the mouth, the pharynx and the nasal passages; the clinical conditions associated with the mechanisms can be interpreted best by remembering the normal uses to which the several structures are put. One of the most constant signs of irritated states is inability to read aloud, or of a sense of fatigue of the muscles of the entire pharynx, as well as of the sides of the neck and face after an effort of the kind. I have recognized this symptom in clinical conditions so remote as hyperplasia of the anterior end of the middle turbinated bone; in adenoid growth at the roof of the pharynx; in paresis of the palato-pharyngeal muscles, whether symmetrical or asymmetrical; in the same condition of the left vocal cord; in unilateral paresis of the tongue; and in abnormal shape of the left cornu of the hyoid bone.

¹ A clinical lecture delivered by invitation before the First District Dental Society of New York.

² Strictly speaking, the parts in question embrace a region bounded inferiorly by the plane of the hyoid bone.



It has been observed that speech in conversation is much more easily managed than speech in reading aloud. The explanation usually given is that in conversation the idea which is to be expressed is formed by the mind before the muscles used in speech are called into co-ordinate action; whereas, in reading aloud the mind is not prepared for what it is expected to demand of the muscles of speech. This, however, does not explain all the facts. For in the instance of professional elocutionists, or of actors, who have committed to memory the words to be uttered, the same difficulty is acknowledged as with those who read from unfamiliar texts. The tongue, in assisting, as it does, in the production of speech-sounds, in an exact manner is to be accused of causing many of these sensations of fatigue. I believe that they are due to the motion at the basal third of the organ, namely, in that part which is raised and depressed to a greater degree than is the case with the anterior two-thirds. It is here teased or compressed by diseased conditions, which are so numerous at the side of the pharynx at the region of the base of the tonsil, and from this point extending downward to the epiglottis. I am convinced that the slightest thickening of the tissues in this part of the pharynx will be sufficient to excite and maintain a sense of weariness or of exhaustion, especially so where the circulation is impaired and the mental intent is decided.

Remarks on the Tongue.—Respecting the anterior two-thirds of the tongue, it is very interesting to watch (these observations, of course, can be very easily conducted when the mouth is open) the delicate undulations which characterize the dorsal surface. Careful inspection, when the mind is once directed to the subject, will convince the observer that the tongue is divided into four nearly equal parts, namely, the basal, the apical, and the two intermediate parts, *viz.*, the pre-basal and the post-apical. The general sensibility of the tongue appears to increase from the tip toward the base; at least this is so if we measure the degree of sensibility by the manner in which the tongue responds to the pressure of an instrument. Thus the most sensitive condition may enable a tongue depressor to be used upon the tip, the part immediately back of the tip, and that in advance of the base; but beyond this, in a majority of individuals, more or less training is required before the pressure is well borne. It is quite possible that the instrument throws down the excessively sensitive lingual base against the lymphoid nodules at the side of the pharynx. In this way the fact is accounted for that the difficulty of controlling the tongue is in inverse ratio as such pressure is applied from the tip of the tongue toward the base. The very opposite conclusion must be drawn as to the distribution of tactile sensibility, which is most developed toward the tip.

One of the most important relations of the tongue and other parts of the cephalic mucous surface is seen in that which exists between this organ and the structures of the lower jaw. At first sight it would appear that no two regions would be more remote than the teeth lodged in the substance of the lower jaw and the mobile muscular lingual structures. But a most disastrous accident can happen by retention of pus at the root of a lower molar tooth, which may open internally and create cellulitis in the loose tissue beneath the mucous membrane of the alveolo-lingual groove. A secondary inflammation excited in this

way is known to extend with marvellous rapidity to the tongue, and an acute glossitis, with all its attendant dangers, be developed in a few hours. Even when these consequences do not ensue, the opening of the alveolar abscess toward the lingual border of the ramus may be associated with pharyngitis on the corresponding side, and with painful deglutition.

Fur on the Tongue.—In this connection permit me to speak of the fur on the tongue. There are many phases of localization of fur which do not arise from general fever, from disturbances of alimentation, or from irritations of the teeth.

In chronic pharyngitis there is almost always a furred condition of the base of the tongue; and the region of the basi-lingual glands is sharply defined, not only by color, but by reason of the white fur which lies directly in front of the base. In acute tonsillitis, and especially in quinsy, the fur is of a yellowish-white color and extends in advance of the base of the tongue; but the tip and the region just back of the tip are almost entirely free.

It is probable that both of these varieties of fur have some connection with the state of the disease with which they are associated, and that both are probably due to changes of temperature. In a word, pharyngitis will develop the fur at the base, and tonsillitis at the base and a portion of the dorsum in advance thereof. It is quite likely that the same disposition will cause fur to be localized to parts opposite the gums and teeth. In an inflamed condition these structures may create an elevation of temperature in that part of the tongue adjacent to it, and thence lead to the formation of patches of fur.

The tongue may be persistently furred throughout when the general health is good, on account of disease which is present within the nasal chambers. I have noticed an example of this in a young lady whose case I have had under observation for a number of years. As a result of scarlet fever in childhood she had suffered from inflammation of the bones entering into the framework of the nose. The tongue was at all times covered with a thick, tenacious, yellowish-white fur. As the case improved under treatment this fur became less marked and at times almost entirely disappeared; but a relapse in the condition of the nasal catarrh was invariably accompanied by a return of the fur on the tongue.

Referred Sensations.—The subject of referred sensations, by which term is meant the reference of a morbid sensation to a structure remote from the cause, is a very curious one. I infer that many of these symptoms are reflexes due to peripheral irritations, and that hypersensitive conditions of the mucous surfaces, from which they originate, always exist. Deeply situated excitants do not usually create them. A foreign body in the substance of the soft palate of a child three months old may create nothing beyond a local soreness of the palate. It is hardly necessary to mention that bullets and other foreign bodies may be carried in the deep tissues for years without exciting any distress, provided that they do not impinge upon nerve trunks. But, in the event of a peripheral irritation of the cephalic mucous membrane being excited by a foreign body, not only is the degree of disturbance uniformly high, but it is often a matter of extreme difficulty to locate it. The sensations of the patient are fallacious and

give us no clue (on the ground of anatomical or physiological data) for their localization. Thus, there appears to be no reason why a peripheral irritation of the mucous membrane of the naso-pharynx, and of the base of the tongue (regions which are so frequently the seat of disease) should be referred to the level of the hyoid bone; yet this is generally the case. I have seen several cases in which foreign bodies were lodged in the mucous membrane of the pharynx on a level with the tonsil, and all the distress was referred to the level of the hyoid bone. If the search had been restricted to the region named, failure in detecting the body naturally would have ensued.

As a striking example of complex conditions referred to the nasal chambers and the brain from dental irritation, I will narrate the following case:

There came under my notice, in the early part of January, 1889, an unmarried man, who performed the duties of janitor in one of the public institutions in Philadelphia. He had suffered for five years from vertigo and occasional convulsions, and had been also for the same period the subject of chronic nasal catarrh.

The membranes overlying the turbinals were puffy, vascular and irritable. The discharge was mucoid and moderate in quantity. The chief distress arose from the disposition to obstruction within the nasal passages. The patient reported on account of the catarrhal trouble. Becoming acquainted with the vertiginous sensations, I urged him to place himself under the care of Dr. Horatio C. Wood, who in response to my inquiries has kindly written to me as follows:

FEBRUARY 6, 1890.

In reply to your inquiries, I state the following history concerning the case of Mr. —, whom you sent to me January 8th, 1889:

He had a nocturnal epileptic convulsion in 1887, and again in the latter part of 1888. Before the convulsions he woke up feeling faint and distressed for a few minutes; became unconscious, was violently convulsed and then slept, waking in the morning as usual. At the time he was seeing me, in January, 1889, he complained much of a dull headache, or rather sense of pressure and weight in the top of the head, extending low down on the occiput. He also complained that in the street and other places he had attacks of a peculiar sensation, as if his "heart was rising and spreading all over him," and in which he would become dizzy and extremely alarmed. Most careful examination failed to detect any evidence of venereal or of local organic disease, past or present. The eye-grounds, the pupils and ocular movements, and the knee-jerks were normal.

He was first treated with bromides and antipyrine, and afterward with mercurials, without being apparently benefited.

Yours truly,

H. C. WOOD.

The catarrhal state proved to be obstinate, and, recognizing its irritative character, I carefully sought for a possible cause for a peripheral reflex. As a matter of general interest I had observed that on both sides the second maxillary deciduous molar was retained in the dental arch, and that no bicuspid were in position. In the lower jaw of the left side the second deciduous molar was retained, but the first bicuspid alone was erupted. On the right side the conditions were normal; namely, the second deciduous molar had been lost, and both the bicuspid were in position. The patient having remained under my care for the catarrhal trouble for a period of eleven months, and the result of the treatment being unsatisfactory, it occurred to me that the irritation exciting the nasal catarrh, the convulsive seizures and the vertigo were reflex in nature and might take their origin in the teeth which were unnaturally present in the jaws, and I therefore advised their extraction. Fortunately for himself, as the event proved, he decided to have the teeth removed. They were accordingly extracted November 5, 1889. The roots were found to be entirely absorbed, and the crowns were easily pushed from their attachments. The patient at once ceased to have any

vertiginous sensations, or disposition to convulsions; the catarrhal state and the obstruction to the nasal passages disappeared, and at this time (three months after the date of extraction) he remains perfectly well. The bicuspid are gradually coming into place in the dental arches and taking their normal positions.¹

The following case illustrates the persistent influence of an exostosed tooth-root exciting a nasal catarrh, lachrymation and occasional epistaxis:

A lady, 35 years of age, reported to me June 3, 1889, with a history of catarrh localized on the left side, and of lachrymation of the corresponding eye, of five years' duration. During the past eighteen months these troubles had been greatly aggravated. The anterior portion of the left middle turbinate bone was enormously enlarged, and was the seat of a constant glutinous, semi-inspissated discharge. Hemorrhages were of frequent occurrence from the same locality. The patient remained under care, although seen at irregular intervals, until December 9, 1889—a period of seven months. At the end of this time I informed her (on the general principles already named) that the catarrhal irritation might be maintained by the first bicuspid tooth, since I found that an artificial crown had long been pivoted to the root. The root was extracted and found to be the seat of exostosis. The patient was promptly relieved of all her distress.

I examined this patient February 4, 1890, and found that the left nasal chamber, instead of being occupied by the large vascular swellings, which was uniformly the case before, was in every way normal, and that the disposition to lachrymation and epistaxis had disappeared.

Much has been written²—and very admirably written—on the subject of reflex neuralgia arising within or about the teeth; but I do not know of any systematic description of neuralgic pains in the teeth dependent upon exciting causes elsewhere, or of various forms of malnutrition of the gums or alveolar process being dependent upon diseased states within the cephalic mucous tract remote from the teeth. In illustration of the first of these statements, namely, dental neuralgia arising in points outside of the dental series, I will mention the following circumstance:

A gentleman was operated upon by myself for a persistent, congestive, irritative catarrh, dependent upon pressure of the maxillary crest against the right inferior turbinate bone. The operation resorted to for his relief consisted in drilling away, on the right side, the points where the crest was exerting injurious pressure. This was done, while the patient was under ether, by means of a large burr-drill. Immediately after the patient recovered from the effects of the ether, he complained of pain in all the teeth in both upper and lower jaws. This condition persisted for two weeks, and was the only circumstance which caused distress attending the operation. The parts healed normally, unattended by inflammation. By the time the nasal condition was corrected the neuralgic pains disappeared.

This patient had never suffered from any trouble of the teeth. They were in good condition, and the only conclusion which could be drawn from the facts was that a reflex dental neuralgia had been established by the lesion determined by the operation, and that it disappeared spontaneously when the parts healed.

In a second case, an operation which consisted in the removal of the anterior part of the left middle turbinate bone was followed by temporary neuralgia in the teeth of the upper jaw of the same side.

¹ This patient has remained well since the above note was written. (H. A.)

² See an excellent paper by Dr. A. P. Brubaker, "American System of Dentistry."

In a third case, in which there was extensive inflammatory infiltration in the left nasal chamber, as a result of scarlet fever in childhood, the patient, a robust man in good general health, always complained of a sharp neuralgic pain in the second molar tooth of the right side each time the middle turbinated bone was touched—no matter how lightly—by a probe. The pain in this instance was transient and determined by the duration of the pressure of the probe against the turbinal. Many instances of the same kind could be cited.

Respecting the second proposition, that malnutrition of the gum-tissue and alveolar process may be maintained by foci elsewhere in the cephalic mucous tract, I will describe the following:

A lady, aged 40, reported January 21, 1888. The patient was of a gouty disposition, which is inherited. Since the nineteenth year she has noticed the gums receding from the necks of the teeth. Ever since she can remember there has been a disposition to take cold from slight causes. The catarrhal state was not distressing until two years ago. At that time she contracted what she called "hay-fever," and for the last two summers during the month of August she suffered from an excessive flow of a irritating serous fluid from the nasal chambers, both front and back, with conjunctival congestions and loss of smell and taste. During the winter of 1888 and 1889 she complained of migraine-like headaches which followed attacks of prolonged and exhausting sneezing.

Inspection showed the first permanent molar teeth and the bicuspid both on the right and left side of the upper jaw to be loose. On gentle pressure, pus exuded from around their necks. The characteristic fetor of pyorrhea alveolaris was on the breath. The throat was excessively irritable, and it was impossible to make any examination of the naso-pharynx. The nostrils were obstructed by large vascular swellings on the anterior ends of the inferior turbinals; these resisted the constricting influence of cocaine. On the left side a synechial band held the inferior turbinals in firm union to the septum.

I recommended that all the loose teeth be immediately extracted, and I declined attempting treatment for the headache and nasal condition until this had been done. The patient for a long time demurred, but finally consented to have the operation performed. The teeth were removed in March, 1888, when without any treatment whatever being directed to the nasal passage other than the division of the synechial band on the left side, the nasal symptoms subsided, the headaches disappeared, and the naso-pharynx became tractable. The patient has comfortably passed through subsequent summers without "hay-fever" attacks.

This case is a striking example of the connection which may exist between nasal irritation and pyorrhea. It can be, therefore, accepted that local factors exist which, being themselves of a gouty origin, excite complex symptoms of other parts of the organism which can be cured by the removal of the exciting cause.

It is also noteworthy that the irritability of the muscles of the pharynx was a symptom. This may have been due, of course, to the presence of morbid secretion, but I believe it to have been, in a measure, sympathetic with the disturbances which were awakened in the entire region of which the offending teeth were parts.

In like manner, many instances can be given of pains in the ear of a neuralgic type which has followed the use of the saw in the nasal passages. Others, in which operations upon the tonsil have caused neuralgic pains which have been referred to the tympanic chambers. Others, in which treatment of the tympanic chambers through the external meatus have excited transient neuralgic pains, which were referred to the sides of the neck, and appeared to have ex-

tended from the region of the external ear to the hyoid bone. In like manner an operation at the roof of the pharynx, especially in the removal of adenoid masses, will be followed by sharp neuralgic pain of short duration, which will be referred to the ear, although the ear, in every respect, is normal.

An illustration of this referred painful state occurred in a patient whose symptoms I have been acquainted with for many years.

A young woman who has suffered from early childhood, as a sequel to scarlet fever, with an osteitis of all bones which enter into the composition of the nasal passages, was subject to a very painful condition at the tip of the tongue at times when the nasal mucous membrane was irritated. The local condition was largely influenced and dependent upon the state of the general health and upon climate, and when these conditions were most favorable, both the nasal and lingual states were satisfactory; but when the recurrence to this neuralgic pain at the tip of the tongue (which was accompanied by enlargement of the lingual papillæ) was detected it was always accepted as a sign by the patient that a course of local treatment to the nose and throat was demanded; and when this demand was met—the parts relieved of the inspissated secretion, and the inflammatory excitement controlled by detergent washes—the pain at the tip of the tongue spontaneously disappeared, and the redness of the papillæ was no longer visible.

A lady who had suffered from great irritability of the nasal mucous membrane was subject to attacks of catarrh, complicated with successive crops of furuncles at the margins of the nostrils. She was of gouty habit, and had been subject to attacks of migraine for many years before the nasal attack. It was an invariable circumstance with this patient that appearance of a furuncle was foretold by sensations of a disagreeable character (which were not accurately described) at the tip of the tongue. The sensations would cease by the time the furuncle was developed. No alterations in the tongue were detected in this case.

Relations of the Upper Teeth to the Maxillary Sinuses and the Nasal Passages.—Notwithstanding the familiar occurrence of empyema of the maxillary sinus from the presence of diseased teeth in the upper jaw, it is only of late years that we have obtained definite information on the subject in those instances in which the walls of the maxillary sinus are not distended. Formerly the diagnosis of abscess of the sinus was obtained by signs developed in the cheek and in the line above the gum; but since the means of investigating the nasal passages have improved, we are enabled to diagnose irritative states of the mucous membrane of the sinus when no signs in the cheek-tissues or in the mouth are present. It is evident that even in a slight degree of involvement of the sinus, the mucus would in time fill up the chamber to the level of the opening by which the sinus communicates with the nasal passage, and act there as an exciting cause to inflammation. By careful inspection it is easy to detect the point at which the fluid enters the nose; in this way the nature of the flow can be determined, and a differential diagnosis between the discharge from the frontal sinus, that from a general exudation of the entire nasal mucous surface, and that from the maxillary sinus be formulated.

In illustration of the connection which exists between disease of the maxillary sinus and the teeth, I will invite attention to the following cases:

A gentleman, aged 33, complained of an offensive discharge from the nostril on the right side for over three years. It became especially distressing within the last year. The patient is a night editor of a metropolitan newspaper. He is of neurotic habit, and is liable to severe attacks of acute rheumatism.

A slight dull pain was acknowledged on pressure on the maxillary sinus of the corresponding side above the region of the second molar on the buccal surface. The middle turbinate bone on the right side was found covered with a quantity of pus. The removal of this enabled me to determine that the mucous membrane was of a purplish color, vascular and painful to the touch. In a few moments after the middle turbinate bone had been cleansed of this discharge it reappeared. This fact, taken in connection with the pain over the maxillary sinus, enabled me to make a diagnosis of abscess of the right maxillary sinus. I recommended that the right second molar be extracted and the parts thoroughly drained. This was accordingly done. No pus escaped, but a quantity of most offensive fluid was washed out into the nasal chamber by a syringe, the nozzle of which was inserted into the socket of the tooth. Directions were given as to the manner in which the patient might keep up the irrigations, and he was allowed to return to his home in a distant city. The patient did well until the fifth week, when he suffered from his old enemy, rheumatism. After the attack subsided, an annoying cough remained, and the offensive discharge returned. This compelled him to report a second time for examination and treatment on October 30, 1887. Examination of the parts showed that the abscess had not returned on the right side, everything being in a normal condition. There was no discharge either in the right nasal passage or through the socket of the tooth which had been extracted; but on the left side the same conditions could be recognized that had been seen before the first treatment as existing on the right side. These conditions were treated in a similar manner, namely, in the extraction of the second molar tooth and washing out the offensive retained material, through the nose into the throat. The patient was permitted to return home. He has been heard from several times since 1887 and remained entirely well.

This case is an example of abscess of the maxillary sinus on one side, apparently dependent upon rheumatic habit of body, being cured by drainage and careful irrigation. A recurrence of an acute rheumatic attack excited a similar condition on the opposite side of the face.

The case is also instructive as to the necessity of giving a guarded opinion upon the subject of recurrence of an abscess which might excite a nasal discharge. The patient in this instance supposed that his original trouble had returned.

A physician, aged 49, reported March 22, 1888. On February 24, he had the third molar of the upper jaw of the right side extracted on account of an alveolar abscess. Severe pain in the jaw ensued.

Examination of the interior of the nose showed the inferior turbinate bone of the right side to be intensely swollen, infiltrated, and streaked with pus. Pus was also found on the right side of the naso-pharynx. After cleansing the parts carefully, in a few moments the material reappeared. The face was not swollen but tender on pressure on the line above the gum.

A diagnosis of purulent inflammation of the right maxillary sinus was made. Since the right side of the upper jaw was edentulous the sinus was opened by a drill at a point of selection, namely, at about the position of the second molar tooth. This was done on account of the fact that drainage had not taken place through the socket of the tooth that had been extracted, and as the roots of this tooth have a disposition to be irregular it was uncertain whether relief could be obtained by drilling along its socket. No pus escaped through the opening made by the drill, but an exceedingly offensive odor exhaled, and the end of the drill was fetid. A syringe was then filled with a weak solution of carbolic acid, its nozzle adapted to the opening made by the instrument, and the fluid slowly injected into the sinus. Upon this manipulation a quantity of pus flowed into the nose and thence to the throat. Daily applications of the solution of carbolic acid were made to the interior of the sinus. At no time was the passage of pus into the mouth sufficient for drainage.

By April 1, an abscess appeared on the right side of the thigh—the consequence of a

puncture of the hypodermic needle used by the patient—and at the same time the sinus reinfamed. Believing that the essential condition had been one of a return of the inflammation of the sinus, leeches were applied to the gum above the point at which the opening had been made. These depletions were followed by some relief. The drainage was still insufficient, and the opening of the sinus into the gum was enlarged.

After the first week following the announcement of the femoral abscess, there was for a month marked elevation of temperature the latter part of each day, with nocturnal sweatings. Although no rigors occurred during this period, the femoral abscess increased and involved the greater part of the outside of the thigh. Its opening was followed by exhaustion and tedious convalescence.

The condition of the maxillary sinus slowly improved. The discharge was, apparently, permanently established from below, and the patient recovered at the end of two months' illness.

It is evident that in this case the inflammation of the sinus ensued upon the extraction of the tooth, and was either traumatic or septic. From the subsequent history of the case and from the fact that a large femoral abscess followed the puncture of a hypodermic needle, I incline to the latter opinion. Rheumatic and gouty dispositions of the system appear to favor inflammatory states of the teeth and jaws.

The following interesting case illustrates the advantage of exploring carefully the maxillary sinus, even when it is not proved to be the source of purulent discharge :

A gentleman, aged 36, reported December 6, 1887. He had been a sufferer from constant neuralgia since 1876. The pain radiated from the right side of the maxilla to the vertex, and was made worse by warm drinks held in the mouth. There had been a posterior discharge from the nose into the throat.

Examination of the naso-pharynx showed the middle turbinated bone in the right choana to be both puffy and convex posteriorly, with shining reflexes on the surfaces. No such appearances were seen on the left side. Seen from in front the septum was bent to the right, and the outer wall of the right nasal chamber was slightly swollen and vascular. No discharge was seen anywhere, either posteriorly or anteriorly, no fetor was detected, nor was pain reported on pressure over the maxilla. After careful consideration it was thought best to have the right upper molar extracted, with the object in view of effecting an entrance into the maxillary sinus and securing drainage. This was done September 12, 1887. No pus escaped through the opening made by the tube. The chamber was washed out, and no pus or increase of discharge appeared within the nasal passage. After the sense of pain attending the extraction of the tooth had ceased, the long-standing neuralgic pain disappeared and never returned. The posterior discharge which had been complained of for four years gradually lessened, and by January 10, had also entirely ceased.

In this case a discharge of four years' standing, and a neuralgia of nine years' standing, were in some obscure way associated with an irritation present on the right side of the face. This had excited vascular swellings in the entire right side of the nasal passage on the level of the right middle turbinated bone, and after a duration of five years proved to be the exciting cause of the localized discharge. Nearly all the conditions were cured by the extraction of a tooth which was removed with the object in view of obtaining access to the maxillary sinus.

Let me in this connection allude to the dangers sometimes occurring in carrying the conservative treatment of teeth to an extreme. I have on more than

one occasion observed that the defective tooth, which was exciting inflammation in the nose, was one upon which the dentist had expended much skill, and put in fillings almost entirely imitating the form and dimensions of the original crown. Doubtless diseased conditions at the root were maintaining persistent inflammation in the lining membrane of the sinus. It is not a pleasant thing for a physician to suggest to a patient, who has expended time and incurred no little expense to save a tooth from loss, that such a tooth be extracted; but the alternative is in an equal degree annoying, namely, that so long as the tooth is retained, an offensive, if not dangerous, discharge from the nasal passage is incurable.

Is it not possible to look forward to a time when, by the generally approved methods of the transplantation of teeth, it may be less important than it now appears to be to keep defective molars in the jaw? Certain it is that maxillary diseases in the better class of patients appear to be increasing. Whether this is owing to the fact that we are now able to detect the presence of such diseases, where in former years it was impracticable to do so, or whether it be due to increased skill on the part of the dentist, who is now able to make useful teeth which were formerly extracted, is a question which I am not in a position to answer.

The Significance of the Hutchinson Teeth.—It has been known for a long time that the shapes of the crowns of the teeth may be modified by morbid influences, exerted during development. When the term "Hutchinson teeth" is used by clinical writers, a definite shape is at once presented to the mind. As you are aware, a disposition exists for the lateral incisor teeth of the upper jaw to become pegged, and for the central incisor teeth of the same jaw to be slightly convex at the sides and to be deeply emarginate (forming a crescentic notch) on the free cutting surface. The molars of both the upper and the lower jaw are often much swollen as their crowns lie in contact with the gum; and stunted cusps are seen rising abruptly and irregularly from the grinding surfaces. The prevalent views concerning the significance of such teeth are, in the first place, that they result from the poison of syphilis acting on the tissues before the birth of the child. Mimetic forms may take their origin during an attack of scarlet fever at a time when the teeth are not yet perfectly developed. It would appear that if a form of tooth could not be accounted for in such a case by the history of syphilis or of scarlet fever, the cause must lie in conditions common to both of these diseases. At the same time, it is assumed that this factor is an inflammation.

If this be conceded, a careful inquiry into the clinical history of the patient who exhibits these deformed teeth should elicit an account of inflammation of the structures of the face occurring at an early period of infancy, or of certain lesions about the face which would indicate that an inflammation had existed in the pre-natal period. But, in point of fact, in some examples the most careful inquiry of parents and nurses, the most exhaustive scrutiny of the parts in the newly born, do not sustain the conclusion that these deformities are due to inflammation.

In this connection allow me to describe a case in which, from all the evi-

dences, it appears that the Hutchinsonian, or an allied deformation, may occur in a child in whom all the evidence of syphilitic taint, or of lesions from scarlet fever, are absent.

A lad in his tenth year lately came under my observation for difficulty arising from oral respiration. He was the son of respectable parents. The father denied the taint of syphilis, and did not exhibit, upon careful examination, any sign of the disease. The child's mother died of phthisis a short time after his birth, and he had been brought up most carefully and intelligently by a nurse, who is acquainted with his clinical history from the time he was born. The child has always been delicate, especially in the functions of digestion and assimilation of food; but there was entire absence of the ordinary signs of syphilis. There was no deformation on the top of the head (which has been described as natiform). There were no fissures in the skin at the nostril, or at the angles of the mouth; no cloudiness of the cornea; no traces of previous eruption on the skin, nor evidence of periosteal disease.

At the fifth year it was observed that oral respiration became established, and there was also a disposition to "take cold" easily.

Examination of the pharynx revealed the presence of a large adenoid growth pendant from the roof. The palatal arch was high and narrow; the obstruction to nasal respiration was absolute. The nasal septum was irregular, apparently due to enormous thickenings of the maxillary crests. The teeth presented all the characters of the Hutchinsonian deformity, excepting, only, that the lateral incisor teeth were not pegged.

After the removal of the adenoid growth, nasal respiration was reëstablished.

Now what, in all probability, has been the order of events in this case? The clinical condition which brought the child under my care was not announced until the fifth year. Evidently this was not the first factor. So far as the shapes of the crowns of the teeth are concerned, they must have arisen at a period certainly not later than at the time when the enamel organs and the dentine bodies were being adapted one to the other. In a word, the shapes of the teeth, as seen at the tenth year, were congenitally deformed. Secondly, the maxilla, especially in the alveolar region, must have been changed by the presence of these malformed teeth. It is scarcely likely that the establishment of oral respiration at a period so late as the fifth year should cause an elevation and narrowing of the palatal arch and hyperostosis of the maxillary crests. If this position be accepted, a narrowed, high, palatal arch, with thickened alveolar processes, would be just as apt to arise because of pre-natal forces (the same that caused the deformation of the teeth) as to be created by the establishment of oral inspiration. We have leaned too much toward the faulty function last named, in attempting to explain this deformation, and not enough, at least in my judgment, to causes which are in operation at the time the teeth are being developed in the maxilla.

On Taste and Smelling.—An interesting study in the connection between the mouth and other divisions of the cephalic mucous tract relates to the senses of smelling and of taste. It is well known that disturbances in nasal respiration interfere with both of these senses; the habit of oral respiration is fatal to their efficiency.

The following case is an illustration of the effect upon consciousness and mental judgment concerning these sensations in an individual in whom, owing to a congenital osseous nasal obstruction, neither taste nor smell had existed prior to the twenty-sixth year.¹

¹ I am indebted to my friend, Dr. Conrad Behrens, for the opportunity of studying this case.

The patient was a married woman, intelligent, but of limited education. She had never breathed through the nose. The palatal arch was narrow and very high. The teeth were irregular. The second bicuspid tooth on the right side had never been erupted. The first molar of each side was ellipsoidal.¹ The thorax exhibited the appearances which accompany the habit of oral respiration.

Examination of the pharynx showed absence of adenoid masses; while the choanal planes were small, oval, and entirely occupied by firm resistant structures which appeared to be osseous in character.

She consented to have an operation performed with the object in view of establishing nasal respiration. This was accordingly done May 2, 1888.

Large burr-drills were used to break down the osseous structures on each side of the vomer, and two openings, fully equal to a circular aperture one-fourth of an inch in diameter, were secured. These openings represented the exact width of the choanal spaces. Additional width could not be obtained, since at each aperture the vomer was on one side, and the internal pterygoid plate on the other. The patient did well, with the exception of a traumatic fever, which disappeared on the fourth day. Owing to the swelling of the mucous membrane incident to the operation, there was no nasal respiration until the sixth day.

On this occasion the patient was lying on a lounge in her chamber when she detected that she could breathe through her nostrils. Instantly something agreeable and novel impressed her consciousness. She arose from the lounge, and, testing the different articles in the room, found that the new sensation had been excited by a banana which was lying on a table near by. She ate some of the fruit. The taste of the banana and its odor were associated in her mind as one and the same thing. She called to her sister and told her that she could now smell and taste, and immediately began to examine a variety of substances, being guided by her sister's knowledge of their properties. As soon as the condition of her health permitted, she found great satisfaction in taking walks in the street, and, when meeting with any distinctive odor, would request her companion to name it for her. In this way, in a surprisingly short time, she became familiar with the more common odors and flavors. The report of these facts, unfortunately, came to me too late to receive from the patient the first impressions of an experience so novel; but on the tenth day after the senses were restored, I made a few observations and subsequently extended them with the following results.

Assuming that the agents which impress the senses of taste and smell are salines, saccharines, acids, bitters and aromatics, I tested her with examples of such substances. I first employed table salt. To my surprise, she stated that she had always been fond of adding salt to her food, although she had never tasted it; but since the operation the dishes of which she formerly partook (which had been heavily salted) now became repulsive. When tested with other salines, such as sodium phosphate and potassium nitrate, she said that they were the same as salt. Of the saccharines, she recognized licorice as something she had tasted before the operation. The patient had been fond of eating candy, apparently on account of the essential oils used in flavoring, and not because of the sugar. Solutions of acetic acid were not recognized. Prior to the operation she had never cared to add vinegar to her food in the quantities in which it is usually used as a condiment. A solution of sulphuric acid—twenty drops to the ounce—and a second of hydrochloric acid of the same strength, were reported to be slightly "bitter." A solution of nitric acid, also of the same strength, was found to be "disagreeable."

¹ By the ellipsoidal tooth I mean a first upper molar whose crown forms an ellipse-like figure, and whose longitudinal axis is not parallel to the dental arch but defines an angle with it. The roots are confluent. The second and third molars are always tritubercular or monotubercular.

The impressions made by bitters was uniformly unpleasant, with the odd exception of quassia, which she did not describe as a bitter. Chiretta was declared to be something she had had before the operation, a statement which was also made in respect to peach kernels. A diluted solution of strychnia was described as "bitter." The term "bitter" was vaguely used, and appeared to be a synonym of "unpleasant" and "disagreeable."

Interesting facts were found in the group of the aromatics. The patient at once recognized oil of cloves and named it. Some years before she had had a carious tooth stopped with it. She stated that prior to the operation a distinction was appreciable between the impressions made by tea and coffee, but that since the operation she could detect degrees of flavor in the different grades, and that the appreciation of these flavors gave her pleasure. Inhaling oil of rose in bulk was found to be unpleasant, but a spray of the oil thrown on the handkerchief was agreeable. The operation being performed before roses were in bloom, the patient did not at first recognize the odor of the oil, but afterward she stated that she had taken pleasure in holding a full-blown rose in her mouth. Cinnamon was recognized; she had appreciated the impression made by it when introduced into food. The flavor of spirits of lemon was immediately associated with that of lemon peel. Oil of gaultheria was novel but not agreeable; she said it "smelt bitter." Creasote was not novel. When informed that the odor might have been detected in partaking of smoke-cured ham, she replied that she at one time lived on a farm, where hams so preserved were occasionally served.

Among volatile agents it was found that the application of "smelling salts" (ammonium carbonate) to the nostrils was recognized, but she declared that before the operation she could never get relief, as did others of her acquaintance, from using this agent for headache. Nitrite of amyl was novel, and suggested the odor of sulphuric ether, which was administered at the time of the operation. It was pleasant, and was the only agent which she requested to be allowed to inhale a second time. Valerian was novel and agreeable. She expressed surprise when informed of its nature, for she had repeatedly taken valerian before the operation. When a solution of hydrochlorate of cocaine was applied to the nostril, she asserted that it "smelt bitter." This was a favorite expression when substances impressed consciousness unpleasantly; if pleasantly, they were said to "smell sweet."

One of the most curious results obtained by the operation was that the sensation of hunger was for the first time experienced. She stated that prior to the operation she had never had any appetite for food, and that the list of articles which she now enjoyed was much larger than before. She named, especially, in this connection, cabbage and tomatoes, which she never could partake of before the operation, but now enjoyed. None of the odors of cooking were ever before appreciated; they were now easily detected. The odor of raw meat was much less decided than that of cooked meat.

The patient passed from observation (evidently not taking the interest in the investigation that I did) before I was in a position to extend the range of the tests.

It would be of value in a similar case to determine in what manner a number of the agents employed had been appreciated, in one way or another, before the nasal chambers had been opened. It is quite evident that prior to the operation distinctions were detected among the substances which subsequently were found to have odor or flavor.

In this imperfect account the following statements may be tentatively accepted. First, that the senses of taste and smell, after they have remained dormant for twenty-six years, may be suddenly awakened by restoring the respiratory functions to the nasal passages. Second, that a variety of substances, which in normal consciousness possess both odor and flavor, can impress in a specific manner the tactile sense in the absence of nasal respiration. Thus rose-leaves and the oil of cloves, pyroligneous substances in smoke-cured meat, tea and coffee, were appreciated through their effects on the tactile sense, when no sensation of taste was present. Third, that when taste was restored, these agents were recognized, but in a different manner than before, as if something had been superadded to the primary impression. The essential oils may have slightly irritated, or, as in the case of oil of cloves, may have induced an analgesic effect. In the instances of tea and coffee, while the distinction between the two agents prior to the operation may have been due to the sensation of touch, when the sensation of taste was superadded the grades of these substances could be for the first time detected. Fourth, that the recognition of volatile substances, such as sulphuric ether, etc., before the operation, was probably due either to the cooling effect they exerted upon the mucous surface, or to the impression made upon consciousness by absorption.

If I have called attention in the above remarks to the commonality of the various parts of the cephalic mucous membrane, and especially if I have shown that clinical studies in the regions of the mouth, the throat, the nasal chambers and the ears are gleanings in the same natural field, I will have presented my best excuse for dwelling upon these themes. A saying of the Dutch occurs to me in this connection: "How it looks to the man on the banks of the canal." One can imagine an honest burgher standing at ease on a canal's edge, while the ships go to and fro as the carriers of Holland's great trade, seeing many things on the decks and in the rigging which are little thought of by those on board. Each one of us in respect to another's work is as a man on the banks of the canal. He may possibly help those who are differently placed to himself.

